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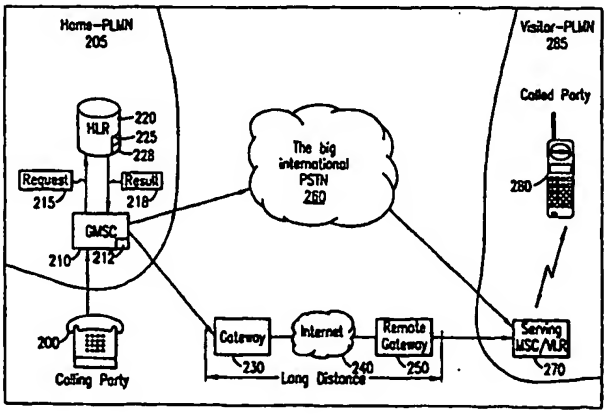

(57) Abstract

A telecommunications system and method is disclosed for reducing the long-distance cost for called mobile subscribers (280) that are roaming in a visitor-Public Land Mobile Network (PLMN) (285). This is achieved by providing a subscriber feature (225) that uses Internet telephony (240) to bypass the long-distance connection (260) between the Gateway Mobile Services Switching Center (GMSC) (210) of a home-PLMN (205) and the serving Mobile Services Switching Center/Visitor Location Register (MSC/VLR) (270) within the visitor-PLMN (285). When an incoming call is routed to the GMSC (210), the GMSC (210) can query the Home Location Register (HLR) (220) for routing information (228) for the called mobile station (280). The HLR (220) sends back this routing information (228), along with service categories (225), to the GMSC (210). Based on this information, the GMSC (210) can decide how to route the call to the serving MSC/VLR (270). If, for example, the subscriber has the service category (225) for "long-distance bypass" set, and the VLR-number (228) indicates that it is possible to reach the serving MSC/VLR (270) via the Internet (240), then the call can be routed through the Internet (240) to the serving MSC/VLR (270). Otherwise, the GMSC (210) will route the call in the conventional manner, as is understood in the art.

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SYSTEM AND METHOD FOR LONG DISTANCE BYPASS FOR TERMINATING MOBILE CALLS

FIELD OF THE INVENTION

The invention relates generally to wireless telecommunications and, more particularly, to utilizing Internet telephony services to reduce long-distance costs associated with incoming calls to a mobile station that is roaming in a visitor cellular network.

BACKGROUND OF THE INVENTION

Cellular telecommunications is one of the fastest growing and most demanding telecommunications applications. Today it represents a large and continuously increasing percentage of all new telephone subscriptions around the world. A standardization group, European Telecommunications Standards Institute (ETSI), was established in 1982 to formulate the specifications for the Global System for Mobile Communication (GSM) digital mobile cellular radio system.

With reference now to FIGURE 1 of the drawings, there is illustrated a GSM Public Land Mobile Network (PLMN), such as wireless network 10, which in turn is composed of a plurality of areas 12, each with a Mobile Services Switching Center (MSC) 14 and an integrated Visitor Location Register (VLR) 16 therein. The MSC/VLR areas 12, in turn, include a plurality of Location Areas (LA) 18, which are defined as that part of a given MSC/VLR area 12 in which a mobile station (MS) 20 may move freely without having to send update location information to the MSC/VLR area 12 that controls the LA 18. Each Location Area 18 is divided into a number of cells 22. Mobile Station (MS) 20 is the physical equipment, e.g., a car phone or other portable phone, used by mobile subscribers to communicate with the wireless network 10, each other, and users outside the subscribed network, both wireline and wireless.

The MSC 14 is in communication with at least one Base Station Controller (BSC) 23, which, in turn, is in contact with at least one Base Transceiver Station (BTS) 24. The BTS 24 is the physical equipment, illustrated for simplicity as a radio tower, that provides radio coverage to the geographical part of the cell 22 for which

it is responsible. It should be understood that the BSC 23 may be connected to several BTSs 24, and may be implemented as a stand-alone node or integrated with the MSC 14. In either event, the BSC 23 and BTS 24 components, as a whole, are generally referred to as a Base Station System (BSS) 25.

With further reference to FIGURE 1, the PLMN Service Area or wireless network 10 includes a Home Location Register (HLR) 26, which is a database maintaining all subscriber information, e.g., user profiles, current location information, International Mobile Subscriber Identity (IMSI) numbers, and other administrative information. The HLR 26 may be co-located with a given MSC 14, integrated with the MSC 14, or alternatively can service multiple MSCs 14, the latter of which is illustrated in FIGURE 1.

The VLR 16 is a database containing information about all of the MS's 20 currently located within the MSC/VLR area 12. If an MS 20 roams into a new MSC/VLR area 12, the VLR 16 connected to that MSC 14 will request data about that MS 20 from its home HLR database 26 (simultaneously informing the HLR 26 about the current location of the MS 20). Accordingly, if the user of the MS 20 then wants to make a call, the local VLR 16 will have the requisite identification information without having to reinterrogate the home HLR 26. In the aforedescribed manner, the VLR and HLR databases 16 and 26, respectively, contain various subscriber information associated with a given MS 20.

When a call to an MS 20 is originated by a subscriber within the fixed network or Public Switched Telephone Network (PSTN) (not shown), the call is routed to a Gateway Mobile Services Switching Center (GMSC) (not shown), which operates as an incoming transit exchange for the PLMN 10. The GMSC determines which HLR 26 the MS 20 is registered in and queries that HLR 26 for the location of the MS 20 by sending a "Send Routing Information" message to the HLR 26, using the Mobile Application Part (MAP) protocol, which is the protocol responsible for signaling procedures with the HLR 26. The HLR 26 then fetches the Mobile Station Roaming Number (MSRN) for the MS 20 from the serving MSC/VLR 14/16 and returns this MSRN, along with location information, e.g., the address of the MSC/VLR 14/16, to the GMSC within a "Send Routing Information Result" message using the MAP

protocol. The GMSC can then route the incoming call to the serving MSC/VLR 14/16 for call connection.

When an MS 20 is roaming, e.g., the MS 20 is located within a visitor PLMN (not shown), it can be quite expensive for the MS 20 to receive calls, especially if the visitor PLMN is located such that a long-distance call must be set-up between the home PLMN 10 and the visitor PLMN in order for the MS 20 to receive calls. Currently, in order to avoid setting-up a long-distance call, the calling party can select to use Internet telephony services. The Internet is based on the Transmission Control Protocol/Internet Protocol (TCP/IP protocol), which was developed as a standard protocol to allow different types of computers to exchange electronic mail and other files over a network. The TCP/IP Protocol specifies the addressing of nodes on the Internet and provides a method of sending packets of data from one node to another. The TCP or Transmission Control Protocol is an application implemented on top of the Internet Protocol to provide reliable delivery of the data packets.

In order to use the Internet telephony services, the calling party can dial a special number, which routes the call to an Internet Gateway (not shown). This Internet Gateway can then route the call through the Internet using the TCP/IP protocol to another remote Internet Gateway on the other end. This remote Internet Gateway can then route the call back into the PLMN 10 to the GMSC for connection of the call to the called party.

However, neither the calling party nor the called party can influence how the call is routed (via Internet or not) from the GMSC to the roaming MS 20. In addition, even if the calling party could influence the routing, there is no motivation for the calling party to do so since it is the called party (mobile subscriber) that will pay for the long-distance connection between the GMSC and the serving MSC/VLR 14/16.

It is, therefore, an object of the invention to allow a called roaming mobile subscriber to bypass the long-distance connection between the GMSC and serving MSC/VLR by permitting the routing of incoming calls to that roaming mobile subscriber from the GMSC to the serving MSC/VLR through the Internet.

SUMMARY OF THE INVENTION

The present invention is directed to telecommunications systems and methods for reducing the long-distance cost associated with connecting calls to mobile subscribers that are roaming in a visitor PLMN. This is achieved by providing a subscriber feature that uses Internet telephony services to bypass the long-distance connection between the GMSC and the serving MSC/VLR. It should be understood that the term Internet includes intranets and any Internet Protocol (IP)-networks. When an incoming call is routed to the GMSC, the GMSC queries the HLR for routing information for the called mobile station. The HLR then sends back this routing information, along with service categories, to the GMSC. Based on this information, the GMSC can decide how to route the call to the serving MSC/VLR. If, for example, the subscriber has a service category set for "long-distance bypass", and the VLR-number and/or the MSRN indicates that it is possible to reach the serving MSC/VLR via the Internet, then the call can be routed through the Internet to the serving MSC/VLR. Otherwise, the GMSC will route the call in the conventional manner, as is understood in the art. Advantageously, by allowing the mobile subscriber to subscribe to this bypass feature, the mobile subscriber can reduce the long-distance costs associated with incoming calls to the mobile subscriber when the mobile subscriber is roaming.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a block diagram of a conventional terrestrially-based wireless telecommunications system;

FIGURE 2 is a block diagram illustrating the routing of an incoming call from a Gateway Mobile Services Switching Center to a Mobile Services Switching Center serving the area that a roaming MS is located in via the Internet, in accordance with preferred embodiments of the present invention; and

FIGURE 3 shows steps in a sample method for routing an incoming call via the Internet to a roaming MS in order to reduce the long-distance costs associated with the call, in accordance with preferred embodiments of the present invention.

DETAILED DESCRIPTION

The numerous innovative teachings of the present application will be described with particular reference to the presently preferred exemplary embodiments. However, it should be understood that this class of embodiments provides only a few examples of the many advantageous uses of the innovative teachings herein. In general, statements made in the specification of the present application do not necessarily delimit any of the various claimed inventions. Moreover, some statements may apply to some inventive features but not to others.

With reference now to FIGURE 2 of the drawings, in order to reduce the long-distance costs for an incoming call to a Mobile Station (MS) 280 which is roaming in a visitor Public Land Mobile Network (PLMN) 285, the mobile subscriber associated with the MS 280 can subscribe to a service category feature 225 which uses Internet telephony services to bypass the long-distance connection between a gateway node or a Gateway Mobile Services Switching Center (GMSC) 210 associated with a home-PLMN 205 and a Mobile Services Switching Center/Visitor Location Register (MSC/VLR) 270 currently serving the MS 280 within the visitor-PLMN 285. It should be understood that the term Internet also refers to Intranet telephony services and/or any Internet Protocol (IP) network. By introducing a terminating service for the mobile subscriber, which can be implemented, for example, by the Intelligent Network (IN), this terminating bypass service can, whenever possible, route the roaming leg, e.g., the connection between the GMSC 210 and the serving MSC/VLR 270, through the Internet 240.

With reference now to FIGURE 3 of the drawings, which will be described in connection with FIGURE 2 of the drawings, when a calling party 200 dials the number associated with the MS 280 (step 300), the call is routed conventionally to the GMSC 210 of the home-PLMN 205 of the called MS 280 (step 310). The GMSC 210 then queries a Home Location Register (HLR) 220 serving the MS 280 for routing information 228 for the MS 280 by sending a "Send Routing Information" message 215 on the Mobile Application Part (MAP) protocol to the HLR 220 (step 320). The HLR 220 then sends back the routing information 228 to the GMSC in a "Send Routing Information Result" message 218 (step 330). The result message 218 can contain, for example, location information, such as the address for the serving

MSC/VLR 270 or the Mobile Station Routing Number (MSRN) 228, service categories, such as TICK or T-CSI, and other supplementary service categories, such as "long distance bypass" 225.

Based on the information 225 and 228 contained in the result message 218, the GMSC 210 must then decide how to route the roaming leg to the visitor-PLMN 285 (serving MSC/VLR 270). If, for example, the mobile subscriber has the service category for "long-distance bypass" 225 set (step 340), and the address for the MSC/VLR 270 and/or the MSRN 228 indicates that the visitor-PLMN 285 can be reached via the Internet 240 (step 350), e.g., the visitor-PLMN 285 has an associated Internet Gateway 250, then the incoming call can be routed to the serving MSC/VLR 270 through the Internet 240 (step 360). Otherwise, the GMSC 210 can route the incoming call to the serving MSC/VLR 270 in a conventional manner (step 370), e.g., through the international Public Switched Telephone Network (PSTN) 260.

In preferred embodiments, the GMSC 210 can determine whether the visitor-PLMN 285 can be reached via the Internet 240 by consulting a table 212 within the GMSC 210 which contains addresses, such as VLR or MSRN numbers 228, along with associated Internet indications of whether the visitor-PLMN's 285 associated with the VLR or MSRN numbers 228 can be reached via the Internet 240. It should be noted that the table 212 can be implemented within an external database, such as an Intelligent Network (IN) node (not shown), e.g., a Service Control Point (SCP), instead of within the GMSC 210 itself. Thus, when the GMSC 210 receives an indication that the subscriber has the service category for "long-distance bypass" 225 set, and determines that the VLR or MSRN number 228 is within a visitor-PLMN 285, the GMSC 210 can query the SCP for an indication of whether the visitor-PLMN 285 can be reached via the Internet 240.

If the table 212 within either the GMSC 210 or an external node indicates that the visitor-PLMN 285 can be reached through the Internet 240, the GMSC can retrieve from the table 212 the routing information 228, e.g., the VLR or MSRN number, along with a prefixed number, which can be, for example, an address for an Internet Gateway 230 associated with the GMSC 210. For example, the received VLR or MSRN number 228 in the result message 218 can be compared with VLR or MSRN numbers within the table 212 to obtain a prefixed VLR or MSRN number. The prefix can be

any number or set of numbers that the GMSC 210 can recognize as an indication that the call should be routed to the visitor-PLMN 285 via the Internet 240.

Once the GMSC 210 determines that the call can be routed to the visitor-PLMN 285 through the Internet 240, the GMSC 210 then routes the call to the Internet Gateway 230 associated with the GMSC 210, using, for example, the prefixed number on the VLR or MSRN number 228. The Internet Gateway 230 can then convert the VLR or MSRN number 228 into an Internet Protocol (IP) address for routing the call to the remote Internet Gateway 250 associated with the visitor-PLMN 285. The original Internet Gateway 230 then also converts the voice and signaling information into IP packets for delivery to the remote Internet Gateway 250 through the Internet 240. When the voice and signaling information is received by the remote Internet Gateway 250, the remote Internet Gateway 250 re-converts the IP address into the VLR or MSRN number 228, re-converts the IP packets into the voice and signaling information, and routes the call to the serving MSC/VLR 270 within the visitor-PLMN 285 using the VLR or MSRN number 228. The serving MSC/VLR 270 can then connect the call to the called MS 280. However, if Internet routing fails and the call cannot be routed to the remote Internet Gateway 250 for any number of reasons, then the GMSC 210 can route the call normally to the serving MSC/VLR 270 through the international PSTN 260.

It should be noted that the bypass feature 225 can be set by the subscriber such that incoming calls are not always routed via the Internet 240. For example, the feature 225 can indicate that incoming calls are to be routed via the Internet 240 only at certain times of the day, e.g., between the hours of 8:00 a.m. and 5:00 p.m. Furthermore, the subscriber can indicate the quality of service (QOS) required for the Internet connection, e.g., the speech quality of the call. The mobile subscriber can, for example, indicate in the subscriber profile sent to the GMSC 210 in the return message 218 that a specific Internet Gateway (not shown) which provides certain guarantees about the speech quality is to be used instead of the Internet Gateway 230 associated with the GMSC 210. The GMSC 210 will then only route the call to that specific Internet Gateway. In this way, the subscriber can ensure that all calls routed through the Internet 240 maintain a certain standard of speech quality. However, the mobile subscriber will typically be billed for requesting an Internet Gateway different than the

normal Internet Gateway used by the GMSC. This "long distance bypass" feature 225 can be further tailored in numerous ways to meet the demands of individual subscribers and network providers.

In addition, it should be noted that the calling party 200 can prevent the call from being routed through the Internet 240 in cases where the calling party 200 is concerned about the speech quality or the security of the call. The calling party 200 can prevent the GMSC 210 from routing the call via the Internet 240 by, for example, dialing a service code, e.g., "*xx", prior to dialing the called party number. The calling party 200 would then preferably have to pay for the long-distance part of the call. Alternatively, if the calling party 200 is concerned about the speech quality but does not want prevent the call from being routed through the Internet 240, the calling party 200 can also request a specific Internet Gateway for the Internet connection, which the calling party would then preferably be billed for.

As will be recognized by those skilled in the art, the innovative concepts described in the present application can be modified and varied over a wide range of applications. Accordingly, the scope of patented subject matter should not be limited to any of the specific exemplary teachings discussed.

For example, it should be understood that the systems and methods disclosed herein can be utilized by any cellular network, including, but not limited to the GSM network, the Personal Digital Cellular (PDC) network, the Personal Communications Systems (PCS) network, the Advanced Mobile Phone System (AMPS) network and the Digital-AMPS (D-AMPS) network.

WHAT IS CLAIMED IS:

1. A telecommunications system for routing an incoming call to a mobile terminal located within a visitor network, said mobile terminal being associated with a home network, said telecommunications system comprising:

a gateway node associated with said home network for receiving said incoming call, said gateway node obtaining routing information for said mobile terminal;

means for determining, using said routing information, whether said incoming call can be routed from said gateway node to said visitor network through an Internet; and

an Internet Gateway connected to said gateway node, said gateway node routing said call to said Internet Gateway when said means for determining determines that said incoming call can be routed to said visitor network through said Internet, said Internet Gateway routing said incoming call to said visitor network through said Internet, said visitor network connecting said call to said mobile terminal.

2. The telecommunications system of Claim 1, wherein said gateway node is a Gateway Mobile Services Switching Center.

3. The telecommunications system of Claim 1, wherein said routing information is a mobile station roaming number.

4. The telecommunications system of Claim 1, wherein said routing information is a visitor location register number, said visitor location register number being associated with a visitor location register serving an area that said mobile terminal is located in.

5. The telecommunications system of Claim 1, wherein said means for determining are within said gateway node.

6. The telecommunications system of Claim 1, further comprising an intelligent node in communication with said gateway node, said means for determining being within said intelligent node.

7. The telecommunications system of Claim 1, wherein said means for determining determines whether said incoming call can be routed to said visitor network through said Internet by using a table, said table containing a plurality of addresses and associated Internet indications, said routing information being within said plurality of addresses, said means for determining indexing on said routing information within said plurality of addresses and obtaining said associated Internet indication.

8. The telecommunications system of Claim 7, wherein said means for determining determines that said incoming call can be routed to said visitor network through said Internet when said Internet indication associated with said routing information is a prefix along with said routing information, said incoming call being routed from said gateway node to said Internet Gateway using said prefix.

9. The telecommunications system of Claim 7, wherein said means for determining determines that said incoming call cannot be routed to said visitor network through said Internet when said Internet indication associated with said routing information is set to "no remote Internet Gateway available".

10. The telecommunications system of Claim 9, wherein said incoming call is routed from said gateway node to said visitor network through an international Public Switched Telephone Network (PSTN) when said Internet indication associated with said routing information is set to "no remote Internet Gateway available", said incoming call having long-distance charges associated therewith when said incoming call is routed through said PSTN.

11. The telecommunications system of Claim 1, further comprising a remote Internet Gateway associated with said visitor network, said Internet Gateway routing said incoming call to said remote Internet Gateway through said Internet, said remote Internet Gateway routing said incoming call to said visitor network.

12. The telecommunications system of Claim 11, wherein said Internet Gateway converts said routing information into an IP address, said Internet Gateway routing said incoming call to said remote Internet Gateway using said IP address, said remote Internet Gateway re-converting said IP address into said routing information, said remote Internet Gateway routing said call to said visitor network using said routing information.

13. The telecommunications system of Claim 1, wherein said visitor network comprises a mobile services switching center in wireless communication with said mobile terminal.

14. The telecommunications system of Claim 1, further comprising a home location register connected to said gateway node, said gateway node obtaining said routing information from said home location register.

15. The telecommunications system of Claim 14, wherein said home location register stores a "long distance bypass" service category associated with said mobile terminal, said home location register sending said service category to said gateway node when said gateway node receives said incoming call, said means for determining determining whether said incoming call can be routed to said visitor network through said Internet when said "long distance bypass" service category is set.

16. A method for routing an incoming call to a mobile terminal located within a visitor network, said mobile terminal being associated with a home network, said method comprising the steps of:

receiving, by a gateway node associated with said home network, said incoming call;

obtaining, by said gateway node, routing information for said mobile terminal;

determining whether said incoming call can be routed from said gateway node through an Internet to said visitor network using said routing information;

in response to a determination that said incoming call can be routed to said visitor network through said Internet, routing, by said gateway node, said incoming call to an Internet Gateway connected to said gateway node;

routing, by said Internet Gateway, said incoming call to said visitor network through said Internet; and

connecting, by said visitor network, said incoming call to said mobile terminal.

17. The method of Claim 16, wherein said gateway node is a Gateway Mobile Services Switching Center.

18. The method of Claim 16, wherein said routing information is a mobile station roaming number.

19. The method of Claim 16, wherein said routing information is a visitor location register number, said visitor location register number being associated with a visitor location register serving an area that said mobile terminal is located in.

20. The method of Claim 16, wherein said step of determining is performed by said gateway node.

21. The method of Claim 16, wherein said step of determining is performed by an intelligent node in communication with said gateway node.

22. The method of Claim 16, wherein said step of determining is performed using a table, said table containing a plurality of addresses and associated Internet indications, said routing information being within said plurality of addresses, said step of determining being performed by indexing on said routing information within said plurality of addresses and obtaining said associated Internet indication.

23. The method of Claim 22, wherein said incoming call can be routed to said visitor network through said Internet when said Internet indication associated with said routing information comprises a prefix along with said routing information, said

incoming call being routed from said gateway node to said Internet Gateway using said prefix.

24. The method of Claim 22, wherein said incoming call cannot be routed to said visitor network through said Internet when said Internet indication associated with said routing information is set to "no remote Internet Gateway available".

25. The method of Claim 24, further comprising, in response to a determination that said incoming call cannot be routed to said visitor network through said Internet, the step of:

routing said incoming call from said gateway node to said visitor network through an international PSTN, said incoming call having long-distance charges associated therewith when said incoming call is routed through said PSTN.

26. The method of Claim 16, wherein said step of routing said incoming call from said Internet Gateway to said visitor network further comprises the steps of:

routing, by said Internet Gateway, said incoming call to a remote Internet Gateway associated with said visitor network through said Internet; and

routing, by said remote Internet Gateway, said incoming call to said visitor network.

27. The method of Claim 26, wherein said step of routing said incoming call from said Internet Gateway to said remote Internet Gateway is performed by said Internet Gateway converting said routing information into an IP address and routing said incoming call to said remote Internet Gateway using said IP address, said step of routing said incoming call from said remote Internet Gateway to said visitor network being performed by said remote Internet Gateway re-converting said IP address into said routing information and routing said call to said visitor network using said routing information.

28. The method of Claim 16, wherein said visitor network comprises a mobile services switching center in wireless communication with said mobile terminal.

29. The method of Claim 16, wherein said step of obtaining is performed by said gateway node obtaining said routing information from a home location register connected to said gateway node.

30. The method of Claim 29, wherein said home location register stores a "long distance bypass" service category associated with said mobile terminal, and further comprising, before said step of determining, the step of:

sending, by said home location register, said service category to said gateway node, said step of determining being performed when said "long distance bypass" service category is set.

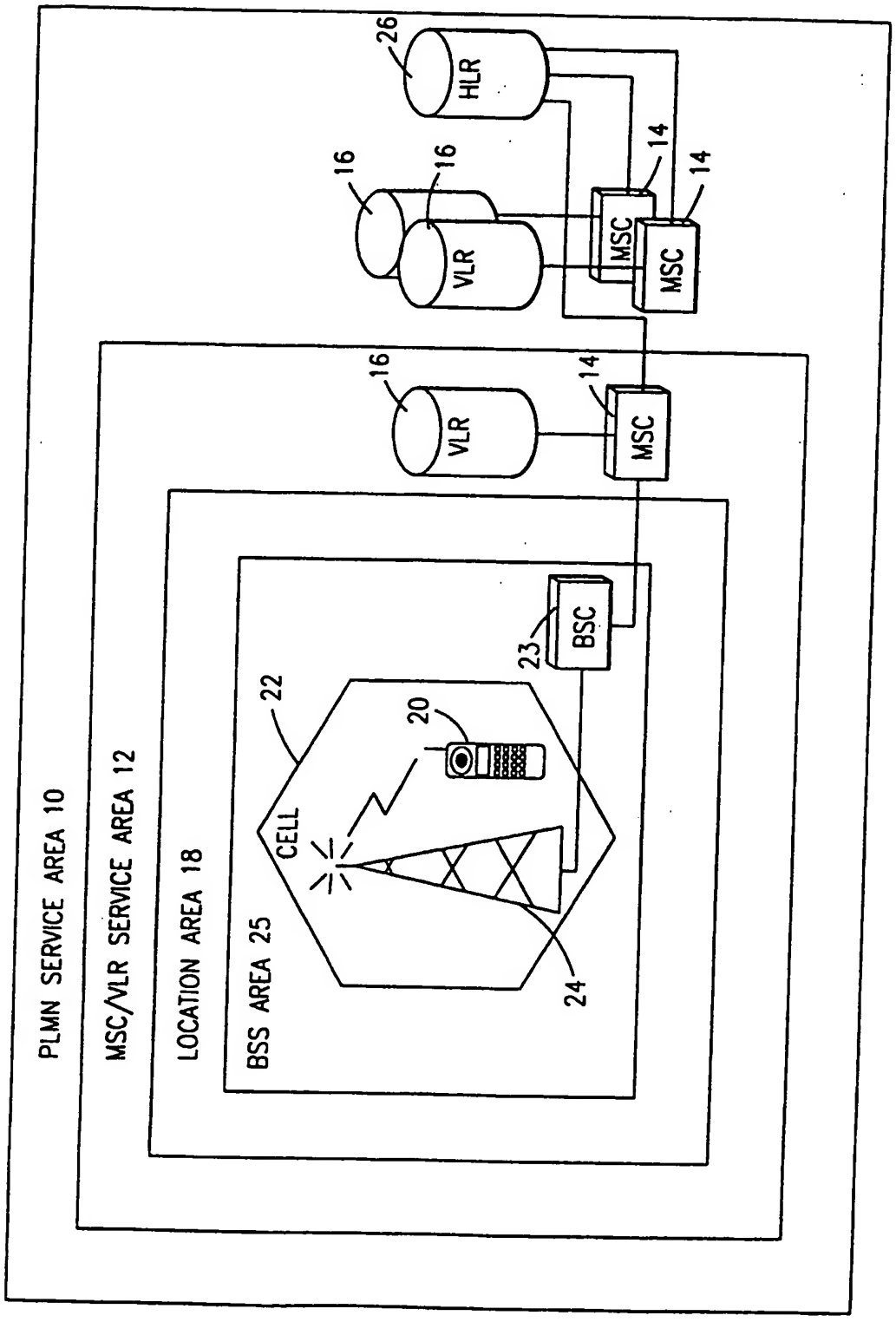
PLMN SERVICE AREA 10
MSC/VLR SERVICE AREA 12
LOCATION AREA 18
BSS AREA 25
CELL
22
20
23
BSC
24
16
VLR
14
MSC
26
HLR

FIG. 1

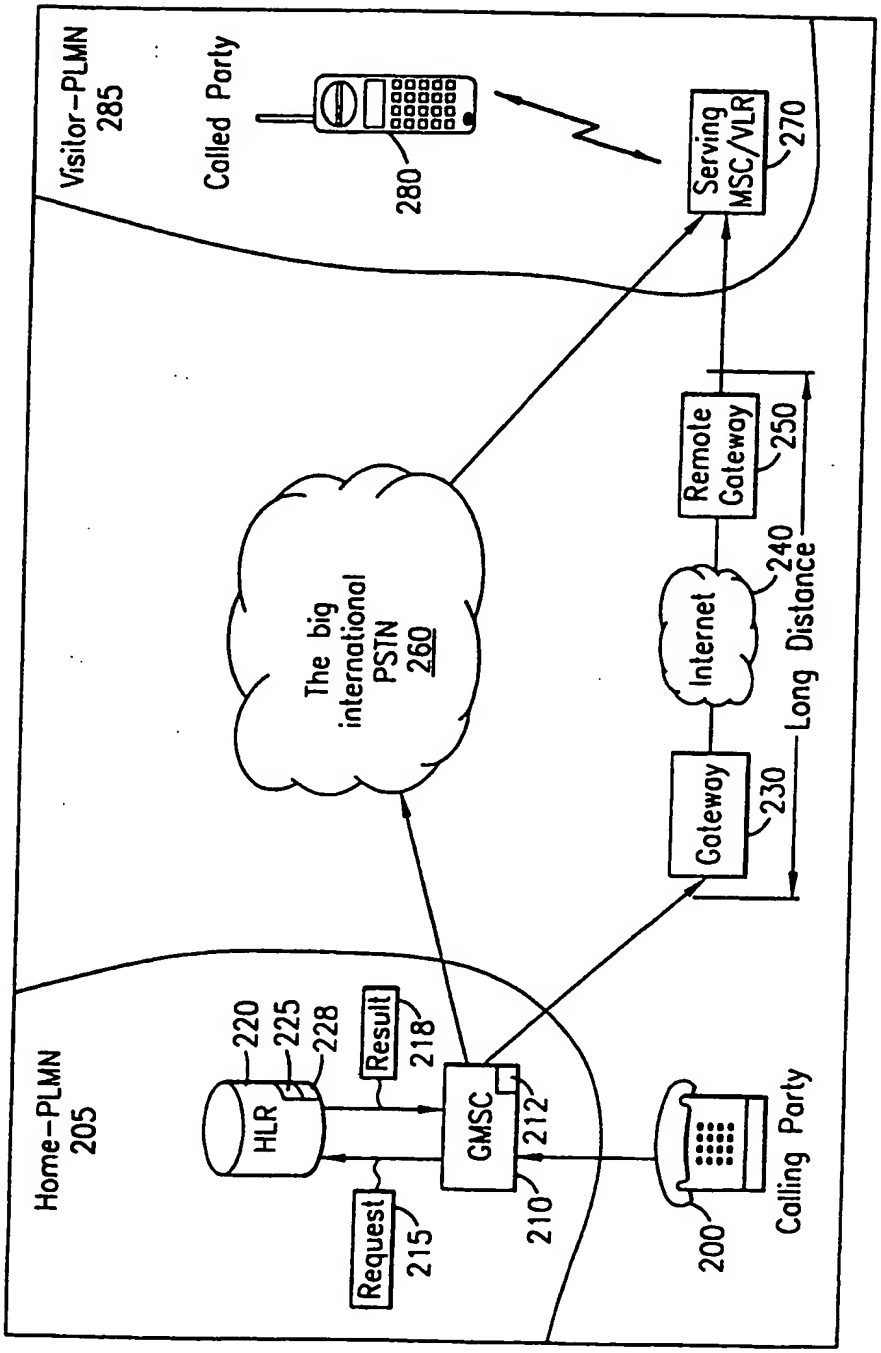
Visitor-PLMN
285
Called Party
280
Serving
MSC/VLR
270
Remote
Gateway
250
240
Long Distance
Internet
Gateway
230
The big
international
PSTN
260
Home-PLMN
205
220
225
228
HLR
Result
218
GMSC
212
210
Request
215
200
Calling Party

FIG. 2

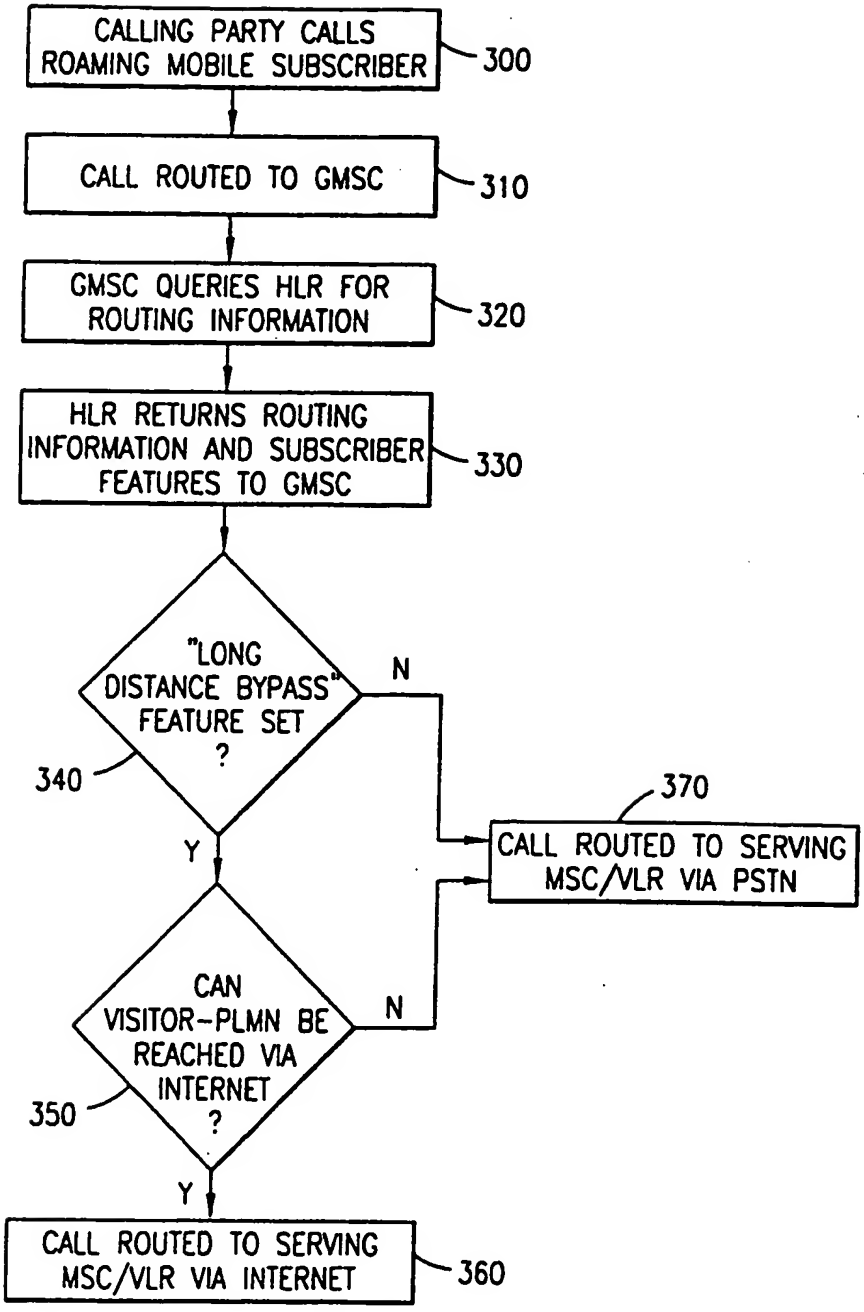
CALLING PARTY CALLS ROAMING MOBILE SUBSCRIBER
300
CALL ROUTED TO GMSC
310
GMSC QUERIES HLR FOR ROUTING INFORMATION
320
HLR RETURNS ROUTING INFORMATION AND SUBSCRIBER FEATURES TO GMSC
330
"LONG DISTANCE BYPASS" FEATURE SET ?
340
N
Y
CAN VISITOR-PLMN BE REACHED VIA INTERNET ?
350
N
Y
CALL ROUTED TO SERVING MSC/VLR VIA PSTN
370
CALL ROUTED TO SERVING MSC/VLR VIA INTERNET
360

FIG. 3

INTERNATIONAL SEARCH REPORT

Inta. ɔnal Application No
PCT/SE 99/01266

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/38 H04M7/00 H04L29/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04Q H04M H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	WO 98 09452 A (TELIA) 5 March 1998 (1998-03-05) page 1, line 25 -page 6, line 23; figure ---	1 2-30
Y	"MICOM Voice/IP Gateway to Interoperate with Microsoft Netmeeting 2.0 for Off-net Calling" NEWS RELEASE,28 April 1997 (1997-04-28), XP000208300 http://www.micon.com/press/msnetmtg.htm see the whole document ---	1
A	WO 95 20299 A (ERICSSON) 27 July 1995 (1995-07-27) page 19, line 7 -page 27, line 5; figures --- -/--	1-30

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 December 1999	28/12/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Geoghegan, C

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INTERNATIONAL SEARCH REPORT

Inte. ...nal Application No
PCT/SE 99/01266

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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P,X	US 5 793 762 A (PENNERS ET AL.) 11 August 1998 (1998-08-11) column 5, line 23 -column 13, line 4; figures	1

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INTERNATIONAL SEARCH REPORT

information on patent family members

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